

Psychosocial interventions for smoking cessation in patients with coronary heart disease (Review)

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ABSTRACT

Background

Quitting smoking improves prognosis after a cardiac event, but many patients continue to smoke, and improved cessation aids are urgently required.

Objectives

To assess the effectiveness of psychosocial interventions such as behavioural therapeutic intervention, telephone support and self-help interventions in helping people with coronary heart disease (CHD) to quit smoking.

Search strategy

The Cochrane Central Register of Controlled Trials (issue 2 2003), MEDLINE, EMBASE, PsycINFO and PSYNDEx were searched from the start of the database to August 2003. Results were supplemented by cross-checking references, and handsearches in selected journals and systematic reviews.

Selection criteria

Randomised controlled studies (RCTs) in patients with CHD with a minimum follow-up of 6 months. After initial selection of the studies three trials with methodological flaws (e.g. high drop out) were excluded.

Data collection and analysis

Abstinence rates were computed according to an intention to treat analysis if possible, or if not on follow-up results only.

Main results

We found 16 RCTs meeting inclusion criteria. Interventions consist of behavioural therapeutic approaches, telephone support and self-help material and were either focused on smoking cessation alone or addressed several risk factors. The trials mostly included older male patients with CHD, predominantly myocardial infarction. Overall there was a positive effect of interventions on abstinence after 6 to 12 months (odds ratio (OR) 1.66, 95% confidence interval (CI) 1.25 to 2.22), but substantial heterogeneity between trials. Studies with validated assessment of smoking status at follow-up had lower efficacy (OR 1.44, 95% CI 0.99 to 2.11) than non-validated trials (OR 1.92, 95% CI 1.26 to 2.93). Studies were clustered by intervention strategy and intensity of the intervention. Clustering reduced heterogeneity, although many trials used more than one type of intervention. The ORs for different strategies were similar (behavioural therapies OR 1.69, 95% CI 1.33 to 2.14; telephone support OR 1.58, 95% CI 1.28 to 1.97; self-help OR 1.48, 95% CI 1.11 to 1.96). More intense interventions showed increased quit rates (OR 1.98, 95% CI 1.49 to 2.65) whereas brief interventions did not appear effective (OR 0.92, 95% CI 0.70 to 1.22). Two trials had longer term follow-up, and did not show any benefits after 5 years.

Authors' conclusions

Psychosocial smoking cessation interventions are effective in promoting abstinence at 1 year, provided they are of sufficient duration. Further studies, with longer follow-up, should compare different psychosocial intervention strategies, or the addition of a psychosocial intervention strategy to pharmacological therapy (e.g. nicotine replacement therapy) compared with pharmacological treatment alone.

PLAIN LANGUAGE SUMMARY

Psychosocial smoking cessation interventions such as behavioural counselling, telephone support and self-help interventions are effective in helping people with coronary heart disease stop smoking. Smoking is a risk factor for coronary heart disease and stopping smoking lowers that risk. Psychosocial smoking cessation interventions such as behavioural therapy, telephone support and self-help materials are effective in helping coronary heart disease patients to stop smoking, if they are provided for over 1 month. We found evidence that psychosocial interventions increased quit rates after 6 months. Most trials used a mixture of different intervention strategies, therefore no single strategy showed superior efficacy.

BACKGROUND

Smoking is a major risk factor for coronary heart disease (CHD). Compared to non-smokers the odds ratio (OR) for myocardial infarction is about 2.5, and for cardiovascular disorders overall the OR is about 2 (Cook 1986; Jacobs 1999; Kawachi 1994; Keil 1998; Njolstad 1996; Nyboe 1991; Prescott 1998; Shaper 1985; Tunstall-Pedoe 1997; Willett 1987; Woodward 1999). Furthermore after a cardiac event smokers are two times more likely to get restenosis or to die from a cardiovascular disease (Cullen 1997; Fulton 1997; Kawachi 1993; Kawachi 1994; Kuller 1991; Luoto 1998; Tverdal 1993; Willett 1987). A recent systematic review in patients with CHD estimated a reduction in mortality risk of 36% in 3-5 years after quitting smoking (Critchley 2003). Non-fatal myocardial infarction also occurs less often in smokers who quit after their first cardiac event (OR 0.62, 95% CI 0.46 to 0.83) (Barth 2007). However, many smokers do not quit, even after a CHD diagnosis (Critchley 2003), and it is critical to summarise available evidence regarding the effectiveness of different intervention strategies for smoking cessation in this patient group.

Several intervention strategies in healthy people have shown encouraging results in systematic reviews. Simple, brief advice from a physician to quit can increase odds of quitting by over 70% (OR 1.74, 95% CI 1.48 to 2.05) (Lancaster 2004) compared with no intervention. Group behaviour therapy has been shown to double success (OR 1.97, 95% CI 1.57 to 2.48) (Stead 2005) compared with self-help interventions and is more effective than no intervention. One systematic review found that more intense interventions did not improve abstinence rates (Lancaster 2005a), however, another review found that telephone counselling was more effective than less intense interventions such as self-help (Stead 2006). Self-help interventions may increase quit rates compared with no intervention but the effect is likely to be small (Lancaster 2005b), and there is no evidence they have any additional effects in combination with counselling.

Rigotti has demonstrated the efficacy of smoking cessation interventions for hospitalised patients and stressed the importance of at least one follow-up contact to maintain abstinence (Rigotti 2007). Another review showed that nursing interventions resulted in improved abstinence rates compared with no intervention (Rice 2004), and showed comparable results in hospitalized and healthy

people. These various treatment strategies can be summarised as psychosocial interventions and can be differentiated from psychopharmacological or substance replacement treatment strategies (e.g. antidepressants, nicotine replacement). A recent review in patients with chronic obstructive pulmonary disorders did not find a beneficial effect of psychosocial interventions on smoking abstinence, but few studies were included (van der Meer 2001). A recent review of smoking cessation interventions in CHD patients did not find any benefits. However, this review included only 12 studies, which had been previously included in published systematic reviews (Wiggers 2003). Although both psychosocial ($n = 10$) and pharmacological interventions ($n = 2$) were included, literature searching was not comprehensive. Integration of the studies was descriptive simply counting positive and negative results and the review was unable to assess possible dose-response relationships or influence of study quality. For cardiac patients, psychosocial interventions to quit smoking are recommended along with nicotine replacement therapies and bupropion (ACC/AHA 2002; DeBacker 2003; Ockene 1997). Yet, there is no clear evidence that psychosocial interventions in patients with CHD are efficacious, whether more intense interventions improve quit rates, or which components of intervention programs result in better abstinence rates.

OBJECTIVES

This review aimed to evaluate psychosocial intervention strategies for smoking cessation in patients with coronary heart disease, with four specific objectives.

1. To examine the efficacy of psychosocial interventions for smoking cessation in patients with coronary heart disease in short term (6 to 12 month follow-up) and long term (more than 12 months).
2. To compare different psychosocial intervention types (e.g. telephone support) to stop smoking in patients with coronary heart disease.
3. To assess the dose-response relationship: Are brief interventions as effective as more intense interventions?
4. To examine methodological criteria which may moderate the efficacy of smoking cessation interventions in patients with coronary heart disease (validation versus self-report of abstinence).

CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

Types of studies

We included randomised controlled trials studying the efficacy of psychosocial interventions for smoking cessation in CHD patients with an assessment of study outcome at least 6 months after baseline assessment of smoking status. Acceptable study designs were:

- a) psychosocial interventions to no such interventions;
- b) psychosocial interventions to other psychosocial interventions; and
- c) psychosocial interventions to the same psychosocial interventions of different intensity.

Types of participants

Patients with CHD - myocardial infarction, coronary artery bypass surgery, percutaneous transluminal coronary angioplasty (International Classification of Diseases 9 codes 410-414). Studies including patients with other diseases were accepted, provided at least 80% of patients had CHD. CHD patients with other comorbidities were included if the diagnosis of CHD was proven. Patients had to be smokers at baseline. Initial smoking status was assessed either by self-report or by additional validation measures. Hospital populations with mixed somatic events (for example pulmonary diseases and cancer) were excluded. Trials were also excluded if there was not sufficient information available about the patient's somatic diagnoses.

Types of intervention

The psychosocial intervention could be provided in two ways; either as a separate psychosocial intervention with a main focus on smoking cessation or as a part of a more comprehensive cardiac rehabilitation programme addressing also other risk factors also (such as diet). Any psychosocial intervention with the goal to change smoking behaviour in CHD patients was of interest. If the intervention strategy was solely based on a pharmacological or a nicotine replacement approach, the study was excluded. Interventions could be delivered initially during hospital admission or after hospital admission to ex-patients. The interventions may be provided in group or individual settings. Interventions that incorporated counselling, support and advice, with or without provision of written materials were included.

Types of outcome measures

Abstinence by self-report or validated (e.g. carbon monoxide) measurement at a minimum of 6 months. The outcome is dichotomous (abstinent versus smoking). We did not extract data on the number of cigarettes smoked per day, as there is little evidence that smoking reduction alters the risk of future cardiac events or mortality.

SEARCH METHODS FOR IDENTIFICATION OF STUDIES

See: Cochrane Heart Group methods used in reviews.

Electronic searches

We searched the Cochrane Central Register of Controlled Trials (CENTRAL) on *The Cochrane Library* (issue 2, 2003), EMBASE (until 1998), MEDLINE (1966-2003), PsycINFO (until week 34, 2003), PSYINDEX (1977-June 2003). No limitations were set to randomised controlled trials. The search strategy for CENTRAL on *The Cochrane Library* is shown below, search strategies for other databases are in additional tables 1 to 4.

- #1 HEART DISEASES (exp MeSH)
- #2 CORONARY ARTERY BYPASS (exp MeSH)
- #3 angina*
- #4 cabg
- #5 (coronary near bypass*)
- #6 (coronary near disease*)
- #7 MYOCARDIAL INFARCTION (exp MeSH)
- #8 (myocard* near infarct*)
- #9 (heart near infarct*)
- #10 chd
- #11 (heart next disease*)
- #12 (cardiac next disease*)
- #13 acs
- #14 ami
- #15 (cardiac next inpatient*)
- #16 (cardiac next patient*)
- #17 (heart next patient*)
- #18 (heart next inpatient*)
- #19 (#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9)
- #20 (#10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18)
- #21 (#19 or #20)
- #22 SMOKING CESSATION (exp MeSH)
- #23 (smoking near cessation)
- #24 (smoking near cease*)
- #25 (smoking near quit*)
- #26 antismoking
- #27 (anti next smoking)
- #28 (smoking near giv*)
- #29 (smoking near stop*)
- #30 (#22 or #23 or #24 or #25 or #26 or #27 or #28 or #29)
- #31 (#21 and #30)

Additionally we searched all databases on *The Cochrane Library* for reviews on smoking cessation

Handsearching

We searched for trials included in other reviews (Lancaster 2005a; Rigotti 2007; Stead 2005; Stead 2006; Wiggers 2003) and hand-searched relevant journals from 1998 to 2003 (Annals of Internal Medicine, Archives of Internal Medicine, British

Medical Journal, Psychology and Health, Health Psychology, Tobacco Control). Additionally we looked through the reference lists of the initially identified trials. We asked experts from the German Statusconference on Psychocardiology for information on other trials (see <http://portal.uni-freiburg.de/psychokardio/>). We did not search for ongoing studies, abstracts, and unpublished studies.

METHODS OF THE REVIEW

Data extraction and coding

Data were independently extracted by two people (JBA and Corina G  thlin). Data on setting, CHD diagnosis or procedure, number of subjects, sex, age, and length of follow up were extracted. Five types of interventions were coded; behavioural therapeutic approaches (BT); phone support (Ph); additional self-help intervention (SH); multi-risk factor interventions (MR); specific interventions for smoking cessation (see Characteristics of included studies table).

Treatment duration

We assessed duration of treatment as in another review (Rigotti 2007) and coded this as follows:

- 1) Single initial contact lasting ≤ 1 hour, no follow-up support;
- 2) One or more contacts in total > 1 hour, no follow-up support;
- 3) Any initial contact plus follow-up ≤ 1 month;
- 4) Any initial contact plus follow-up > 1 month and ≤ 6 month; and
- 5) Any initial contact plus follow-up > 6 month.

Methodological quality

We coded biochemical validation of smoking status as 0=no and 1=yes; this validated assessment of abstinence was a very relevant methodological aspect of included studies.

Quality of randomisation and allocation concealment was not coded because of lack of data in most of the trials.

Data analysis

We analysed data on both an intention-to-treat (ITT) and a follow-up basis. A conservative model classified persons without information about smoking status at follow-up as smokers (ITT analysis). A second model included only participants with follow-up information on smoking status. The latter model results in higher rates of abstinence in experimental and control group (termed 'optimistic model'). We present data of the conservative analysis (ITT) in preference, and only used data from the optimistic model if the ITT analysis was not possible. As a sensitivity analysis, we performed meta-analysis only including those trials where we could calculate the more conservative ITT analysis. We performed three sub-group analyses:

- Trials with validated smoking status at follow-up were compared to non-validated trials.

- Trials grouped by type of intervention.
- Trials with a treatment duration of less than 1 month versus studies with an intervention of 1 month or more.

Odds ratios with 95% confidence intervals were calculated for the pooled estimates. An OR > 1 indicates superiority of the intervention group over usual care and vice versa. Heterogeneity was assessed by examining forest plots of trials, by calculating chi squared heterogeneity test, and I^2 statistics. The chi squared value tests for statistically significant heterogeneity between trials; higher I^2 values indicate greater variability between trials than would be expected by chance alone (range 0-100%) (Higgins 2003). A random-effects model for pooling the studies was employed because of expected heterogeneity in the primary studies (DerSimonian and Laird method) (Deeks 1999). Significant chi squared values indicate heterogeneity and therefore the pooled effect sizes must be interpreted with caution.

DESCRIPTION OF STUDIES

The combination of the hits in the databases searched and additional citations found by scanning references in relevant Cochrane Reviews, other meta-analyses, and journals resulted in 2012 hits. After exclusions on the basis of title and abstract, 520 papers were assessed for inclusion. Of these only 241 studied an intervention for smoking cessation in cardiac patients. First we excluded all studies without a randomised controlled design ($n = 145$). For the exclusion of other non-relevant studies ($n=71$) the reason for exclusion is detailed in the characteristics of excluded studies table. A further three studies were excluded using post hoc exclusion criteria. Feeney 2001 had a drop out $> 50\%$ of randomised patients (OR 48.17 95% CI 6.42 to 361.51); Lisspers 1999 was excluded because assessment of smoking status was made after cardiac procedure had been performed, which risks confounding non-smokers with those who quit around the time of the procedure (OR 24.20, 95% CI 0.93 to 629.32); and Mitsibounas 1992 reported a statistically significant difference in patient characteristics (age/sex) between the intervention and control groups at baseline (OR 16.00, 95% CI 2.73 to 93.62). Four papers are awaiting assessment as we could not access the papers (Becker 2003; Boulay 2001; Enriquez-Puga 2001; Puente-Silva 1989).

The remaining 18 reports of 16 trials were included in the review (Allen 1996; Burt 1974; Carlsson 1997; CASIS 1992; DeBusk 1994; Dornelas 2000; Hajek 2002; Heller 1993; Ortigosa 2000; Quist-Paulsen 2003; Reid 2003; Rigotti 1994; Sivarajan 1983; Taylor 1990; van Elderen (group); van Elderen (phone)). Seven studies were carried out in Europe (1 Sweden, 2 United Kingdom, 2 Netherlands, 1 Norway, 1 Spain), seven were from the USA, one from Australia and one from Canada. The papers were mainly published in English (15), one was written in Spanish (Ortigosa 2000). All trials compared a specific smoking cessation intervention with

a usual care condition, had comparable groups at study entry, had lower than 50% drop out rates and assessed smoking status before a cardiac event or procedure. 1323 patients were randomised to the usual care group and 1354 received a special psychosocial intervention. As expected, 70 to 90% of the patients were male, mean age was relatively young, 50 to 60 years. The patients suffered predominantly from myocardial infarction or had invasive interventions (bypass surgery, stent). The intervention strategies employed were behavioural therapeutic interventions (10 studies), and self-help programmes (11 studies). Additional phone support was provided in 11 trials. Nine studies reported interventions aimed specifically at smoking cessation, seven studies employed multi-risk strategies. Behavioural therapeutic interventions were either provided in a group setting or as individual counselling. The aim was to identify cues related to smoking, or more generally stress reduction and relaxation techniques. Other components included preparation for relapse or specific motivational techniques based on the transtheoretical model (Prochaska 1986) or the strategy of motivational interviewing (Rollnick 1997). Self-help interventions consisted of information booklets, audio- or videotapes. Information booklets which simply described risk factors were not considered self-help interventions. No studies were available for the comparison of different psychosocial interventions or of psychosocial intervention with different intensity.

METHODOLOGICAL QUALITY

All studies assessed abstinence 12 months after the initial intervention, except two (Heller 1993; Sivarajan 1983), which assessed abstinence after 6 months. Two trials also provided data on a long-term follow up after 5 years (CASIS 1992; Rigotti 1994). Seven of the 16 trials validated self-reported abstinence. In five trials data for the 'optimistic model' was reported (n=462), 11 trials provided sufficient data for an ITT analysis (n=2215). Unfortunately, it was impossible to extract detailed information on the randomisation procedure from most of the trials. Only four trials used adequate allocation concealment (Allen 1996; Dornelas 2000; Hajek 2002; Reid 2003).

RESULTS

Psychosocial smoking cessation interventions were effective in achieving smoking abstinence in CHD patients, compared with usual care. In all trials, patients receiving the specific psychosocial intervention had more than a 60% higher odds of quitting (OR 1.66, 95% CI 1.25 to 2.22). There was considerable heterogeneity between individual studies (χ^2 42.68; df 15, $P < 0.0002$, I^2 64.9%) (comparison 01 01). Therefore the overall result has to be interpreted with caution. There were considerable differences between trials in the proportion of abstinent patients at follow-up: Taylor 1988 achieved 70% abstinence in the intervention group

but Ortigosa 2000 report the same number of patients abstinent without intervention. Hajek 2002 report the lowest abstinence rates in the patients receiving psychosocial intervention (39%) and Carlsson 1997 report the lowest values for control group patients (25%).

The pooled ORs suggest that psychosocial interventions can greatly increase odds of quitting compared with usual care, but the heterogeneity in the results needed further exploration. The quality of the trials may partly explain this heterogeneity. Allocation concealment has been shown empirically to influence trial results (Jüni 2001). Few studies reported adequate allocation concealment. We pooled results for these studies, but results of the combined effect measure must be interpreted with caution, due to the limited statistical power (Allen 1996; Dornelas 2000; Hajek 2002; Reid 2003). The non-significant OR of trials using adequate allocation concealment was 1.10 (95% CI 0.75 to 1.60). The largest trial with adequate allocation concealment was also a brief intervention (Hajek 2002), which we found not to be effective (comparison 01 02). The pooled OR for allocation concealed trials appears lower than for all trials, but due to limited number of studies it is impossible to assess whether this is due to higher quality (allocation concealment), or the brevity of the intervention.

Sensitivity analysis of only trials using ITT analysis showed less benefit than all trials combined, but remained clinical important (nearly a 50% increase in odds of quitting) and statistically significant (OR 1.47, 95% CI 1.10 to 1.96) but considerable heterogeneity remained (χ^2 25.27, df 10, $P < 0.005$, I^2 60.4%) (comparison 01 03).

Sub-group analyses

Trials validating smoking status

Trials which validated self-reported smoking status showed lower quit rates than trials where measurement was not validated. If trials with validated abstinence are pooled, the OR falls from 1.92 (95% CI 1.26 to 2.93) for non-validated trials to 1.44 (95% CI 0.99 to 2.11) for validated measures (comparison 02 01).

Types of intervention

We found no clear evidence that any treatment strategy was more efficacious than others, but heterogeneity was reduced within the intervention cluster. Behavioral therapeutic interventions showed a significant effect on abstinence (OR 1.69, 95% CI 1.33 to 2.14) with lower heterogeneity (I^2 23.5%) (comparison 03 01). Telephone support was also effective (OR 1.58, 95% CI 1.28 to 1.97) and trials reasonably consistent (I^2 9.9%) (comparison 03 02). However, as most behavioural therapy trials also used telephone support as an intervention strategy, it is difficult to separate the effects of these two types of interventions. Two trials used solely a behavioural therapeutic approach without additional phone contacts (Sivarajan 1983; van Elderen (group)). One trial used telephone support without behavioural therapeutic techniques (Ortigosa 2000). Interventions using self-help materials showed com-

parable effectiveness (OR 1.48, 95% CI 1.11 to 1.96) (comparison 03 03). Stratification of trials using self-help materials reduced heterogeneity only slightly (I^2 56.2%). We also considered the specificity of the intervention (smoking cessation alone compared with a multi-risk factor intervention). No difference was found between multi-risk factor interventions (OR 1.73, 95% CI 1.27 to 2.35) and specific cessation intervention (OR 1.63, 95% CI 1.08 to 2.46) (comparison 03 04). While the heterogeneity in specific intervention trials increased (I^2 77.8%) the results of multi-risk factor intervention trials were statistically homogenous (I^2 0%).

Duration of the intervention

We found clear evidence that brief interventions (i.e. no follow-up contact or within 4 weeks after initial intervention) were not effective (Hajek 2002; Heller 1993; Ortigosa 2000; Rigotti 1994) (OR 0.92, 95% CI 0.70 to 1.22, I^2 0%) (comparison 04 01). When CHD patients were treated with interventions including follow-up contacts after the initial period of 1 month, the odds of quitting increased substantially (OR 1.98, 95% CI 1.49 to 2.65, I^2 50.3%) (comparison 04 01). There was less heterogeneity between trial results when clustered by intensity of the intervention.

Long-term follow-up

We found no evidence for efficacy of smoking cessation interventions in the long-term. Due to high drop-out rates after 5 years, an analysis for people available at follow-up and an ITT analysis were performed. Neither the optimistic model (OR 1.32, 95% CI 0.78 to 2.24) nor the ITT analysis (OR 1.23, 95% CI 0.79 to 1.93) showed superior efficacy to a control group (comparisons 05 01 and 05 02, respectively).

A potential problem with all systematic reviews is publication bias. Our literature search was comprehensive, prepared and partly carried out by the Cochrane Heart Group (UK). Additionally, we investigated publication bias using a funnel plot. The results appear reasonably symmetric which is an indicator of a publication of the studies independent of the study result (Figure 01). There may be a slight tendency for larger trials to show smaller benefits; but larger studies may have interventions with shorter duration and hence smaller effect sizes.

DISCUSSION

We found support for the efficacy of smoking cessation interventions with more than 1 month duration, but brief interventions without some follow-up contact were not effective. We were unable to determine the minimum number of contacts needed. More detailed conclusions about effective intervention strategies are obscured by the fact that a mixture of different intervention measures were included in many trials. Interventions using telephone support, behavioural therapies, and self-help were all effective. Some interventions focussed only on smoking cessation, but others ad-

ressed smoking as part of a multiple risk factor intervention programme (generally a 'cardiac rehabilitation programme'). There was no difference in the odds of quitting for multiple risk factor cardiac rehabilitation programmes, compared with interventions focussing only on smoking cessation. 'Cardiac rehabilitation' programmes may vary in their components, but generally include a graded exercise programme and may also include advice and support from a range of health professionals (such as dieticians, behavioural change specialists etc). It is difficult to distinguish between the effects of the smoking cessation component of these programmes, and the general support and encouragement that may be given by other health professionals. Some trials employ nicotine replacement therapy (NRT) as additional cessation strategies, which we could not control for. In one trial, more patients in the psychosocial intervention group received NRT compared to the usual care group (DeBusk 1994). Other trials did not report use of NRT.

Our findings are contrary to a recently published review on smoking cessation interventions in CHD patients which found no benefits (Wiggers 2003). The difference may be due to more comprehensive literature searching in our review, whereas Wiggers et al aggregated 12 primary studies listed in already existing Cochrane reviews. Another difference is the methodology of the reviews. Wiggers et al counted 'positive' and 'negative' results, whereas we performed a meta-analytic pooling. The important advantage of a meta-analytic approach is the weighting of studies by sample size and event rate.

One possible threat to our results might be methodological flaws in the primary studies. Validation of abstinence was reported in primary studies, and associated with lower efficacy. The OR of quitting in validated trials was only of borderline statistical significance; however these validated trials also included many with only a brief intervention. Despite the high validity of self reported smoking status in the general population (Patrick 1994) the validation of smoking status should be recommended in efficacy trials with coronary heart disease patients (Woodward 1992).

AUTHORS' CONCLUSIONS

Implications for practice

After a cardiac event about 30% to 50% of smokers with CHD quit without professional help. Additional psychosocial interventions show a superior quitting rate compared to standard care. Interventions for smoking cessation in CHD patients should last for more than 1 month. Brief interventions may not be effective. The overall effect of psychosocial smoking cessation interventions in CHD patients can be expressed by the number needed to treat statistics with a figure of 9.7. This means about 10 patients had to be treated for one person to be abstinent from tobacco after 1 year.

Implications for research

Trial procedures and quality should be described in more detail, according to CONSORT guidelines (Begg 1996). Also more details on the duration and intensity of the intervention (total duration, number of sessions, numbers of pages in leaflets etc) are needed. The validation of smoking status was not a standard procedure in the trials as only seven described using any measure of biochemical validation. Further trials should validate smoking status objectively.

Studies comparing different psychosocial interventions or psychosocial intervention of different intensity are lacking. Hence future research should focus on the comparison of different smoking cessation strategies in CHD patients (Schmitz 1999). It is still unclear whether individual counseling or group counseling are more beneficial in CHD patients. Also recent results of reviews show limited effects of stage based smoking cessation interventions (Riemsma 2003; vanSluis 2004). More detailed studies will be useful to identify components of successful intervention strategies. This approach will require fewer studies but with larger sample sizes to demonstrate relatively small, but clinically important differences between strategies. Future trials should compare the additional benefits of combining NRT and psychosocial rehabilitation, compared with NRT or psychosocial interventions alone.

NOTES

Used abbreviations

AMI: acute myocardial infarction

AP: angina pectoris

BIOSIS: Database on life science and biomedical research (www.biosis.org)

CABG: coronary artery bypass graft

CHD: coronary heart disease

CI: confidence interval

EMBASE: Database with biomedical and pharmacological information (www.embase.com)

ICD: International Classification of Diseases

ITT: Intention to treat analysis

Medline: database of the U.S. National Library of Medicine

MI: myocardial infarction

MeSH: Medical subject heading

N: Number of studies

n: Number of patients

OR: Odds ratio

OM: Optimistic model

PsycINFO: database of the American Psychological Association

PSYINDEX: database of the Center for Psychological Information and Documentation at the University of Trier, Germany

PTCA: percutaneous transluminal coronary angioplasty

POTENTIAL CONFLICT OF INTEREST

None known.

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* Indicates the major publication for the study

TABLES

Characteristics of included studies

Study	Allen 1996
Methods	OM
Participants	138 women who underwent first-time CABG at a hospital. IG: 14 smokers CG: 11 smokers
Interventions	Usual care: patient education and instructions for exercise. Psychosocial intervention: nurse-directed multimodal behavioural program based on social cognitive theory (videotape, workbook, counselling). Started with discharge from hospital, two updates 1 and 2 months later (BT, Ph, SH, MR, Intensity 4)
Outcomes	Follow-up at 12 months (abstinence self report)
Notes	IG: OM = 64.3% CG: OM = 54.5%
Allocation concealment	A – Adequate

Characteristics of included studies (Continued)

Study	Burt 1974
Methods	OM
Participants	280 men in a coronary care unit with AMI IG: 125 smokers CG: 98 smokers
Interventions	Usual care: conventional advice to stop smoking by physician. Psychosocial intervention: information about the effects of smoking by physician and nurse, reinforced by a booklet about coronary-risk factors. Continued in follow-up clinic and through a community nurse. (Specific, Intensity 5)
Outcomes	Follow-up at 12 months (abstinence self-report)
Notes	IG: OM = 63.2% CG: OM = 27.5%
Allocation concealment	C – Inadequate

Study	CASIS 1992
Methods	OM, ITT
Participants	267 smokers with CAD of 3 hospitals who scheduled for coronary arteriography IG: 135 smokers CG: 132 smokers
Interventions	Usual care: brief advice from physician to stop smoking. Psychosocial intervention: intervention provided by trained behaviourally oriented health educators: inpatient counselling session (30 min), outpatient counselling visits and telephone calls (at 1 and 3 weeks, abstinent smokers at 3 months, relapsed smokers at 2 and 4 months), outpatient group program, self-help materials. (BT, Ph, SH, Specific, Intensity 4)
Outcomes	Follow-up at 6, 12 and 60 months (validation by saliva samples)
Notes	IG: OM = 57.3% ITT = 34.8% CG: OM = 47.4% ITT = 28%
Allocation concealment	B – Unclear

Study	Carlsson 1997
Methods	OM
Participants	168 patients with AMI admitted to the coronary care unit at Malmö General Hospital IG: 32 smokers CG: 35 smokers
Interventions	Usual care: two visits to general practitioner. Psychosocial intervention: nurse-directed secondary prevention unit after the usual follow-up schedule: education and counselling (individual and group sessions) about smoking, exercise, nutrition for about 9 hours and exercise training 2-3 times per week. Visits to cardiologist after 2, 3, 6 months and to nurse after 3, 5, 6, 9, 12 months. (MR, Intensity 5)
Outcomes	Follow-up at 12 months (abstinence self-report)
Notes	IG: OM = 50% CG: OM = 25.7%
Allocation concealment	B – Unclear

Characteristics of included studies (Continued)

Study	DeBusk 1994
Methods	OM
Participants	585 patients with AMI in five medical centres IG: 131 smokers CG: 120 smokers
Interventions	Usual care: counselling on dietary change, lipid lowering therapy, and on demand smoking cessation interventions. Psychosocial intervention: physician-directed, nurse-managed, home-based case-management system (behavioural intervention, telephone and mail contact) in addition to the usual care. Started in the hospital and finished 12 months later. (BT, Ph, SH, MR, Intensity 5)
Outcomes	Follow-up at 6 and 12 months (abstinence validated)
Notes	IG: OM = 70.2% CG: OM = 53.3%
Allocation concealment	B – Unclear

Study	Dornelas 2000
Methods	OM, ITT
Participants	100 smokers with AMI admitted to hospital IG: 54 smokers CG: 46 smokers
Interventions	Usual care: verbal and written recommendation to watch education video of AHA. Psychosocial intervention: bedside cessation counselling (motivation for cessation, relapse prevention) delivered by a psychologist based on the transtheoretical model. Seven telephone calls at 1, 4, 8, 12, 16, 20, 26 weeks (BT, Ph, Specific, Intensity 4)
Outcomes	Follow-up at 6 and 12 months (validation by a significant other)
Notes	IG: OM = 70% ITT = 51.8% CG: OM = 40% ITT = 34.8%
Allocation concealment	A – Adequate

Study	Hajek 2002
Methods	OM, ITT
Participants	540 patients in hospitals in UK with MI and CABG IG: 274 CG: 266
Interventions	Usual care: verbal advice to stop smoking and booklet "Smoking and your heart". Psychosocial intervention: in 17 hospitals patients motivated to stop smoking received intervention. Education with booklet (Smoking and your Heart) from the British Heart Foundation. Short quiz on contents of the booklet; support of other cardiac patient is arranged by nurse Duration about 34min (SH, Specific, Intensity 1)
Outcomes	Follow-up at 6 weeks and 12 months (validated)
Notes	IG: OM = 39% ITT = 36% CG: OM = 43% ITT = 41%

Characteristics of included studies (Continued)

Allocation concealment A – Adequate

Study	Heller 1993
Methods	OM
Participants	450 patients with AMI discharged from the hospital IG: 66 smokers CG: 73 smokers
Interventions	Usual care: no specific information given Psychosocial intervention: letter to the subjects' GP, three mail-out packages for the subjects (information about nutrition, smoking, walking programme) and monthly newsletters. (SH, MR, Intensity 1)
Outcomes	Follow-up at 6 months (abstinence self-report)
Notes	IG: OM = 65% CG: OM = 53%
Allocation concealment	C – Inadequate

Study	Ortigosa 2000
Methods	OM, ITT
Participants	90 patients with myocardial infarction in hospital in Spain IG: 43 smokers CG: 47 smokers
Interventions	Usual care: advice only. Psychosocial intervention: advice by doctor immediately after admission to hospital (10 minutes). Additional enhancement of motivation by nurses and phone contacts (after 2, 3, 4 weeks). (Ph, Specific, Intensity 3)
Outcomes	Follow-up at 1, 3 and 12 months (validated)
Notes	IG: OM = 62% ITT = 61% CG: OM = 69% ITT = 66%
Allocation concealment	B – Unclear

Study	Quist-Paulsen 2003
Methods	OM, ITT
Participants	Patients in hospital (reasons myocardial infarction, angina pectoris, coronary artery bypass surgery) IG: 118 smokers CG: 122 smokers
Interventions	Usual care: no specific intervention. Psychosocial intervention: group intervention with nurses (twice a week). Booklet with emphasis on health benefits from smoking cessation. Also fear arousing message about death rates of persistent smokers. Advice not to smoke during hospital stay and motivation for NRT if needed additional phone contacts (5 times) in 5 months after hospital stay. (BT, Ph, SH, Specific, Intensity 4)
Outcomes	Follow-up 12 months (validated)
Notes	IG: OM = 57% ITT = 48% CG: OM = 37%

Characteristics of included studies (Continued)

ITT = 36%	
Allocation concealment	B – Unclear
Study Reid 2003	
Methods	ITT
Participants	Patients in hospital in Canada (reasons: angiography, PTCA, Myocardial infarction, coronary artery bypass surgery. IG: 126 smokers CG: 128 smokers
Interventions	Usual care: no additional intervention after discharge. Psychosocial intervention: assessment of smoking status after 4 weeks. Abstinent patients were reinforced. Those still smoking were offered support by nurse (3 sessions with 20minutes in 8 weeks) and additionally nicotine patch therapy (BT, Ph, SH, Specific, Intensity 4)
Outcomes	Follow-up at 3 and 12 months (not validated self-report)
Notes	IG: ITT = 39% CG: ITT = 36%
Allocation concealment	A – Adequate
Study Rigotti 1994	
Methods	ITT
Participants	93 patients (smokers) scheduled for CABS in the postoperative cardiac surgery unit at Massachusetts General Hospital IG: 44 smokers CG: 43 smokers
Interventions	Usual care: Brief advice not to smoke within a group session. Psychosocial intervention: Nurse-based smoking cessation and relapse prevention programme adapted from the American Lung Association's "In Control" programme: three-counselling sessions, videotape, family members were included. Phone call 1 week after discharge by nurse. (BT, Ph, SH, Specific, Intensity 3)
Outcomes	Follow-up at 2, 4, 8, 12 months and 5 years (validation by saliva cotinine)
Notes	IG: ITT = 43% CG: ITT = 44%
Allocation concealment	B – Unclear
Study Sivarajan 1983	
Methods	OM, ITT
Participants	258 patients hospitalised with AMI IG1: 43 smokers IG2: 39 smokers CG: 37 smokers
Interventions	Usual care: conventional medical and nursing management. Psychosocial intervention: two intervention groups - EG1: exercise only (for 12 weeks, weekly clinic visits); EG2: exercise, teaching and counselling (8 group sessions about risk factors, diet, exercise, stress management etc, individual counselling if needed). Data only of EG 2 used for analysis. (BT, SH, MR, Intensity 4)

Characteristics of included studies (Continued)

Outcomes	Follow-up at 3 and 6 months (abstinence self-report)
Notes	IG: OM = 48% ITT = 33% CG: OM = 58% ITT = 37%
Allocation concealment	B – Unclear
Study	Taylor 1990
Methods	OM
Participants	173 patients (smokers) admitted to hospital with AMI IG: 72 smokers CG: 58 smokers
Interventions	Usual care: no specific instruction to stop smoking. 10% participated in non smoking classes. Psychosocial intervention: nurse-managed intervention based on social learning theory: manual “Staying Free”, 2 audio tapes for relaxation. Telephone contact after discharge (6 times), counselling after relapse. (BT, Ph, SH, Specific, Intensity 4)
Outcomes	Follow-up at 6 and 12 months (biochemical validation)
Notes	IG: OM = 70% CG: OM = 44%
Allocation concealment	A – Adequate
Study	van Elderen (group)
Methods	OM
Participants	Of 477 patients with CHD after discharge from hospital 258 were included. Diagnosis: MI (144), CABS (42), PTCA (10), other (21) IG: 64 smokers CG: 64 smokers
Interventions	Usual care: standard rehabilitation with medical care and physical training. Psychosocial intervention: health education programme “Heart and Health” based on Ellis’ Rational Emotive Therapy (ABCDE model): information about heart disease, risks, diet, exercise, identification and modification of irrational beliefs. 8 weekly group sessions (2h) for the patients and their partners, one follow-up session at 2 months. (BT, MR, Intensity 4)
Outcomes	Follow-up at 3 and 12 months (abstinence self-report)
Notes	IG: OM = 62% CG: OM = 50%
Allocation concealment	B – Unclear
Study	van Elderen (phone)
Methods	OM
Participants	60 patients admitted to hospital with AMI IG: 15 smokers CG: 16 smokers
Interventions	Usual care: standard medical care. Psychosocial intervention: health education and counselling programme: two nurse-based counselling sessions, two group health education sessions (medication, aetiology of MI, risk factors, anxiety, depression etc). Weekly telephone contacts by nurse after discharge for 6 weeks.

(Ph, SH, MR, Intensity 4)

Outcomes	Follow-up after intervention, at 8 weeks and 1 year (abstinence self-report)
Notes	IG: OM = 60% CG: OM = 37%
Allocation concealment	B – Unclear
OM = optimistic model; ITT = intent to treat analysis; CABG = coronary artery bypass surgery; CAD = coronary artery disease; AMI = acute myocardial infarction; CG = control group; IG = experimental intervention group; GP = general practitioner	
Duration of treatment is coded as follows (intensity):	
coding 1: single initial contact lasting <= 1 hour, no follow-up support	
coding 2: one or more contacts in total > 1 hour, no follow-up support	
coding 3: any initial contact plus follow-up <=1 month	
coding 4: any initial contact plus follow-up > 1 month and <= 6 month	
coding 5: any initial contact plus follow-up > 6 month.	
Number in notes section show abstinence rates in percent	

Characteristics of excluded studies

Study	Reason for exclusion
Andersen 2002	Patients with other disease, or healthy subjects
Baughman 1982	No intervention specified or no specific smoking cessation intervention
Belson 2002	Heterogeneity in diagnosis included / no assessment of smoking status
Bolman 2002	Follow up too short
Brenner 1989	No intervention specified or no specific smoking cessation intervention / no assessment of smoking status
Byfield 2001	Patients with other disease, or healthy subjects / no assessment of smoking status
Campbell 1996	Heterogeneity in diagnosis included
Campbell 1998a	No clear diagnosis of CHD
Campbell 1998b	No clear diagnosis of CHD
Circo 1985	Follow up too short
Connett 1984	No information about diagnosis included
Cook 1989	No data reported
Cupples 1999	Patients with other heart disease
Eaker 1982	Patients with other disease, or healthy subjects
Engblom 1992	no intervention specified or no specific smoking cessation intervention
Erdman 1983	No intervention specified or no specific smoking cessation intervention
Feeney 2001	Drop out > 50%
Finnegan 1985	Cross sectional analysis, not sufficient data / no intervention specified or no specific smoking cessation intervention
Fletcher 1987	No intervention specified or no specific smoking cessation intervention / no comparison of smoking status feasible
Fortmann 1994	No intervention specified or no specific smoking cessation intervention / no comparison of usual care and specific psychosocial intervention
Frasure-Smith 1997	No comparison of smoking status feasible
Fredrickson 1995	Patients with other disease, or healthy subjects / no intervention specified or no specific smoking cessation intervention / follow up too short

Hall 1983	Heterogeneity in diagnosis included
Haskell 1994	No possibility to include data in meta-analysis
Hjermann 1986	Heterogeneity in diagnosis included
Horlick 1984	No comparison of smoking status feasible
Houston-Miller 1997	Heterogeneity in diagnosis included
Jones 1996	No intervention specified or no specific smoking cessation intervention / no assessment of smoking status
Joseph 1996	No intervention specified or no specific smoking cessation intervention
Kallio 1981	Follow up too short
Knutsen 1991	Patients with other disease, or healthy subjects
Kornitzer 1980	Patients with other disease, or healthy subjects
Kornitzer 1989	Patients with other disease, or healthy subjects / no comparison of smoking status feasible
Kristeller 1993	No comparison of smoking status feasible
Kuller 1991	Heterogeneity in diagnosis included / no intervention specified or no specific smoking cessation intervention
Lancaster 1999	Patients with other disease, or healthy subjects
Lisspers 1999	Assessment of smoking status was made after cardiac procedure had been performed
Marra 1985	No intervention specified or no specific smoking cessation intervention
Mayou 2002	No intervention specified or no specific smoking cessation intervention / no comparison of smoking status feasible
McHugh 2001	No assessment of smoking status
Meland 1999	Cross sectional analysis, not sufficient data
Mitsibounas 1992	Statistically significant difference in patient characteristics at baseline between intervention and control groups
Murchie 2003	No clear diagnosis of CHD
Nisbeth 2000	Patients with other disease, or healthy subjects
Ornish 1990	No comparison of smoking status feasible / no assessment of smoking status
Patel 1985	No information about diagnosis included / no comparison of smoking status feasible
Prieme 1998	Patients with other disease, or healthy subjects / cross sectional analysis, not sufficient data / no intervention specified or no specific smoking cessation intervention / no assessment of smoking status
Rice 1994	Heterogeneity in diagnosis included
Risser 1990	Patients with other disease, or healthy subjects
Rose 1978	Patients with other disease, or healthy subjects
Rose 1982	Patients with other disease, or healthy subjects
Rose 1992	Patients with other disease, or healthy subjects
Sanders 1989	No information about diagnosis included
Schmitz 1999	No comparison of usual care and specific psychosocial intervention
Simon 2003	Heterogeneity in diagnosis included
Sippel 1999	Heterogeneity in diagnosis included
Steptoe 1999	Other heart diseases / patients with other disease, or healthy subjects
Steptoe 2001	Other heart diseases / patients with other disease, or healthy subjects
Stewart 1999	Other heart diseases / no intervention specified or no specific smoking cessation intervention
Suurkula 1996	Heterogeneity in diagnosis included
Taylor 1988	No intervention specified or no specific smoking cessation intervention

Characteristics of excluded studies (Continued)

Taylor 1997	No assessment of smoking status
Tiffany 1986	Patients with other disease, or healthy subjects
Tonnesen 1999	Other heart diseases
Tonstad 2003	Heterogeneity in diagnosis included / no intervention specified or no specific smoking cessation intervention
Toobert 1998	No comparison of smoking status feasible
Toobert 2000	No comparison of smoking status feasible
Tzivoni 1998	Cross sectional analysis, not sufficient data /no intervention specified or no specific smoking cessation intervention
Vedin 1976	No intervention specified or no specific smoking cessation intervention
Wallner 1999	No intervention specified or no specific smoking cessation intervention / no assessment of smoking status
Waters 1996	No intervention specified or no specific smoking cessation intervention
Wewers 1994	Heterogeneity in diagnosis included
Whitlock 1997	Heterogeneity in diagnosis included / no information about diagnosis included

ADDITIONAL TABLES

Table 01. EMBASE search strategy

#1 HEART DISEASES (exp MeSH)
#2 CORONARY ARTERY BYPASS (exp MeSH)
#3 angina*
#4 cabg
#5 (coronary near bypass*)
#6 (coronary near disease*)
#7 MYOCARDIAL INFARCTION (exp MeSH)
#8 (myocard* near infarct*)
#9 (heart near infarct*)
#10 chd
#11 (heart next disease*)
#12 (cardiac next disease*)
#13 acs
#14 ami
#15 (cardiac next inpatient*)
#16 (cardiac next patient*)
#17 (heart next patient*)
#18 (heart next inpatient*)
#19 (#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9)
#20 (#10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18)
#21 (#19 or #20)
#22 SMOKING CESSATION (exp MeSH)
#23 (smoking near cessation)
#24 (smoking near cease*)
#25 (smoking near quit*)
#26 antismoking
#27 (anti next smoking)
#28 (smoking near giv*)

Table 01. EMBASE search strategy (Continued)

#29 (smoking near stop*)
#30 (#22 or #23 or #24 or #25 or #26 or #27 or #28 or #29)
#31 (#21 and #30)

Table 02. Search strategy for MEDLINE, Pre-MEDLINE, BIOSIS and Journals@Ovid

#1 (HEART DISEASES) in KW,MESH,PS (44527 records)
#2 (coronary artery bypass) in KW,MESH,PS (25318 records)
#3 angina* (40369 records)
#4 cabg (5015 records)
#5 coronary near bypass (32268 records)
#6 coronary near disease (124131 records)
#7 (myocardial infarction) in KW,MESH,PS (87348 records)
#8 myocard* near infarct* (109488 records)
#9 heart near infarct* (10780 records)
#10 chd (6501 records)
#11 heart next disease* (113611 records)
#12 acs (2061 records)
#13 ami (6556 records)
#14 cardiac next inpatient* (54 records)
#15 cardiac next patient* (11097 records)
#16 heart next patient* (10654 records)
#17 heart next inpatient* (10 records)
#18 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 (322389 records)
#19 (smoking cessation) in KW,MESH,PS (6284 records)
#20 smoking near cease* (87 records)
#21 smoking near cessation (9035 records)
#22 smoking near quit (1849 records)
#23 antismoking (329 records)
#24 anti next smoking (464 records)
#25 smoking near giv* (1106 records)
#26 smoking near stop* (2067 records)
#27 #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 (11672 records)
#28 #18 and #27 (1181 records)

Table 03. Search strategy for PsycINFO

#1 TI coronary artery bypass Or AB coronary artery bypass Or MJ coronary artery bypass
#2 TI angina Or AB angina Or MJ angina
#3 TI cabg Or AB cabg Or MJ cabg
#4 TI coronary Or AB coronary Or MJ coronary
#5 TI bypass Or AB bypass Or MJ bypass
#6 TI myocard Or AB myocard Or MJ myocard
#7 TI myocard Or AB myocard Or MJ myocard
#8 TI diseas* Or AB diseas* Or MJ diseas*
#9 TI heart* Or AB heart* Or MJ heart*
#10 TI chd Or AB chd Or MJ chd
#11 TI acs Or AB acs Or MJ acs

Table 03. Search strategy for PsycINFO (Continued)

#12 TI ami Or AB ami Or MJ ami
#13 TI cardiac Or AB cardiac Or MJ cardiac
#14 TI patient* Or AB patient* Or MJ patient*
#15 TI inpatient* Or AB inpatient* Or MJ inpatient*
#16 TI smok* Or AB smok* Or MJ smok*
#17 TI cessation Or AB cessation Or MJ cessation
#18 TI cease* Or AB cease* Or MJ cease*
#19 TI quit Or AB quit Or MJ quit*
#20 TI anti Or AB anti Or MJ anti
#21 TI giv* Or AB giv* Or MJ giv*
#22 TI stop* Or AB stop* Or MJ stop*
#23 (S5 And S4)
#24 (S8And S4)
#25 (S7 And S6)
#26 (S9And S7)
#27 (S14 And S13)
#28 (S15 And S13)
#29 (S14 And S9)
#30 (S15 And S9)
#31 (S30 Or S29 Or S28 Or S27 Or S26 Or S25 Or S24 Or S23 Or S15 Or S14 Or S13 Or S12 Or S11 Or S10 Or S9 Or S8 Or S7 Or S6 Or S5 Or S4 Or S3 Or S2 Or S1)
#32 (S17 And S16)
#33 (S18 And S16)
#34 (S19 And S16)
#35 (S20 And S16)
#36 (S21 And S16)
#37 (S22 And S16)
#38 (S37 Or S36 Or S35 Or S34 Or S33 Or S32 Or S22 Or S21 Or S20 Or S19 Or S18 Or S17 Or S16)
#39 (S37 Or S36 Or S35 Or S34 Or S33 Or S32)
#40 (S13 Or S12 Or S11 Or S10 Or S9 Or S8 Or S7 Or S6 Or S5 Or S4 Or S3 Or S2 Or S1)
#41 (S39 and S40)

Table 04. Search strategy for PSYNDEXplus

#1 HEART DISEASES
#2 CORONARY ARTERY BYPASS
#3 angina*
#5 coronary near bypass*
#6 coronary near disease*
#7 MYOCARDIAL INFARCTION
#8 myocard* near infarct*
#9 heart near infarct*
#10 chd
#11 heart next disease*
#12 cardiac next disease*
#13 acs
#14 ami
#15 cardiac next inpatient*
#16 cardiac next patient*

Table 04. Search strategy for PSYINDEXplus (Continued)

#17 heart next patient*
 #18 heart next inpatient*
 #19 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18
 #20 SMOKING CESSATION
 #21 smoking near cessation
 #22 smoking near cease*
 #23 smoking near quit*
 #24 antismoking
 #25 anti next smoking
 #26 smoking near giv*
 #27 smoking near stop*
 #28 #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27
 #29 herz
 #30 herzininfarkt
 #31 kardiovaskulaer*
 #32 KHK
 #33 myokard*
 #34 koronar*
 #35 bypass
 #36 #29 or #30 or #31 or #32 or #33 or #34 or #35
 #37 raucherentwoehnung
 #38 tabakabstinenz
 #39 tabak near abstinenz
 #4 cabg
 #40 rauchen near abstinenz
 #41 rauchen near aufhoeren
 #42 #37 or #38 or #39 or #40 or #41
 #43 #19 or #36
 #44 #28 or #42
 #45 #43 and #44

ANALYSES

Comparison 01. Efficacy of psychosocial interventions on abstinence (6 to 12 months; all trials)

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Abstinence 6 to 12 months (ITT preferred and OM)	16	2677	Odds Ratio (Random) 95% CI	1.66 [1.25, 2.22]
02 Abstinence 6 to 12 months (ITT preferred and OM)	4	919	Odds Ratio (Random) 95% CI	1.10 [0.75, 1.60]
03 Abstinence 6 to 12 months (ITT only)	11	2215	Odds Ratio (Random) 95% CI	1.47 [1.10, 1.96]

Comparison 02. Sensitivity analysis validation (abstinence 6 to 12 months)

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Abstinence at 6 to 12 months	16	2677	Odds Ratio (Random) 95% CI	1.66 [1.25, 2.22]

Comparison 03. Grouped by type of intervention (6 to 12 months)

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Abstinence 6 to 12 months BEHAVIORAL THERAPY	16	2677	Odds Ratio (Random) 95% CI	1.66 [1.25, 2.22]
02 Abstinence 6 to 12 months TELEPHONE SUPPORT	16	2677	Odds Ratio (Random) 95% CI	1.66 [1.25, 2.22]
03 Abstinence 6 to 12 months SELF HELP MATERIALS	16	2677	Odds Ratio (Random) 95% CI	1.66 [1.25, 2.22]
04 Abstinence 6 to 12 months Specific vs. Multi-Risk-Factor Intervention	16	2677	Odds Ratio (Random) 95% CI	1.66 [1.25, 2.22]

Comparison 04. Sensitivity analysis brief / intense intervention (6 to 12 months)

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Abstinence 6 to 12 months all studies	16	2677	Odds Ratio (Random) 95% CI	1.66 [1.25, 2.22]

Comparison 05. Efficacy of psychosocial interventions on long term abstinence (five years)

Outcome title	No. of studies	No. of participants	Statistical method	Effect size
01 Abstinence five years (OM only)	2	226	Odds Ratio (Random) 95% CI	1.32 [0.78, 2.24]
02 Abstinence five years (ITT only)	2	348	Odds Ratio (Random) 95% CI	1.23 [0.79, 1.93]

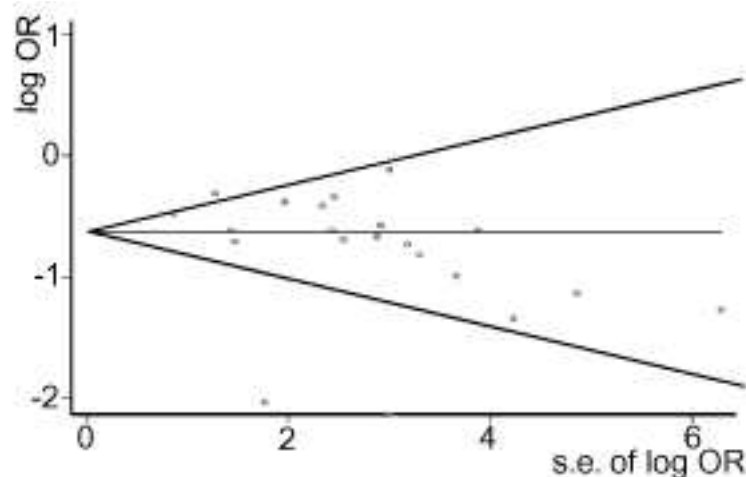
COVER SHEET

Title	Psychosocial interventions for smoking cessation in patients with coronary heart disease
Authors	Barth J, Critchley J, Bengel J
Contribution of author(s)	JBa performed initial searches for studies, assessed studies for inclusion, carried out data extraction and edited review. JC gave advice on statistical procedures, and edited review JBe edited review
Issue protocol first published	/
Review first published	2008/1
Date of most recent amendment	30 October 2007
Date of most recent SUBSTANTIVE amendment	03 October 2007

What's New	Information not supplied by author
Date new studies sought but none found	Information not supplied by author
Date new studies found but not yet included/excluded	Information not supplied by author
Date new studies found and included/excluded	Information not supplied by author
Date authors' conclusions section amended	Information not supplied by author
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GRAPHS AND OTHER TABLES

Figure 01. Funnel plot

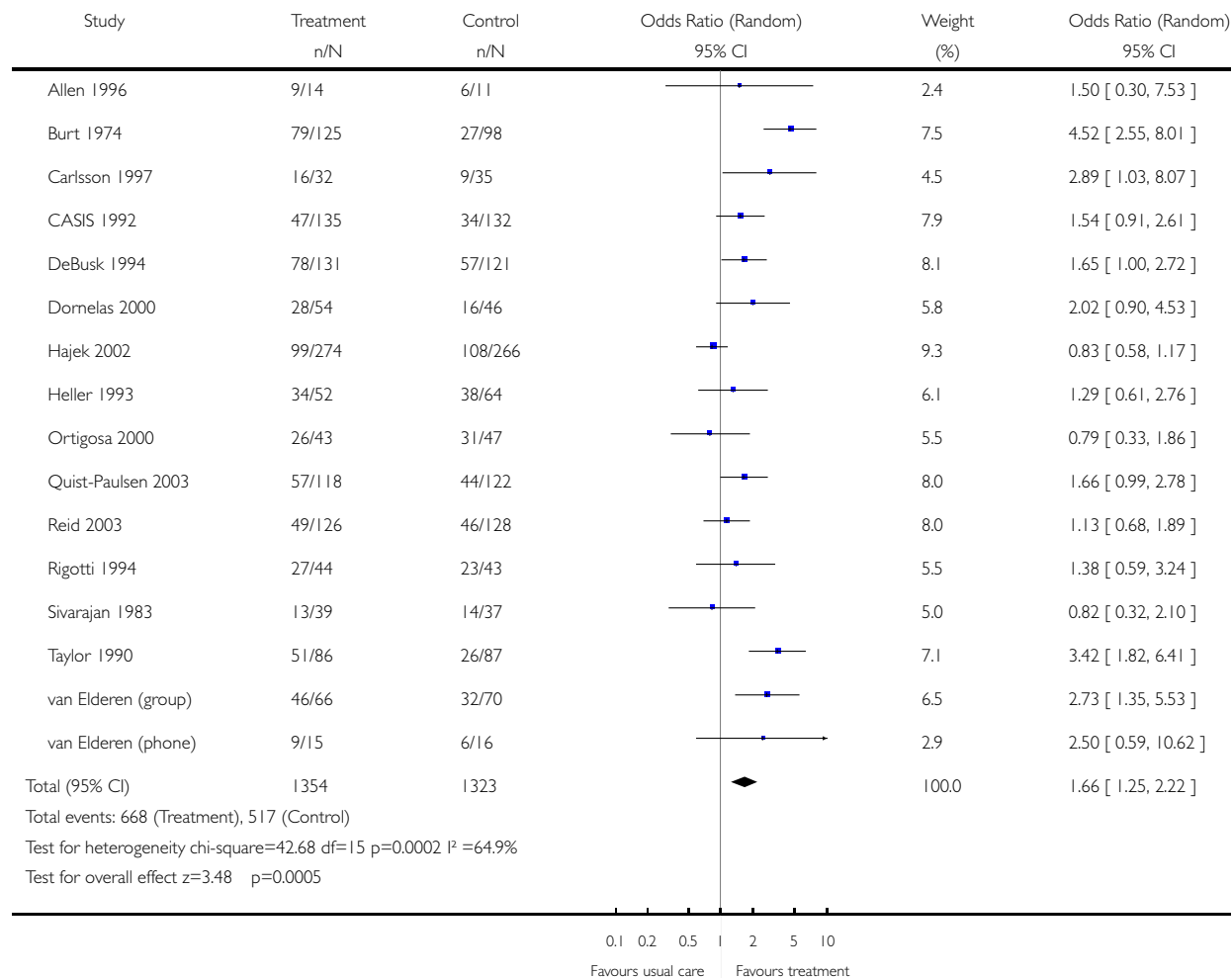


Analysis 01.01. Comparison 01 Efficacy of psychosocial interventions on abstinence (6 to 12 months; all trials), Outcome 01 Abstinence 6 to 12 months (ITT preferred and OM)

Review: Psychosocial interventions for smoking cessation in patients with coronary heart disease

Comparison: 01 Efficacy of psychosocial interventions on abstinence (6 to 12 months; all trials)

Outcome: 01 Abstinence 6 to 12 months (ITT preferred and OM)

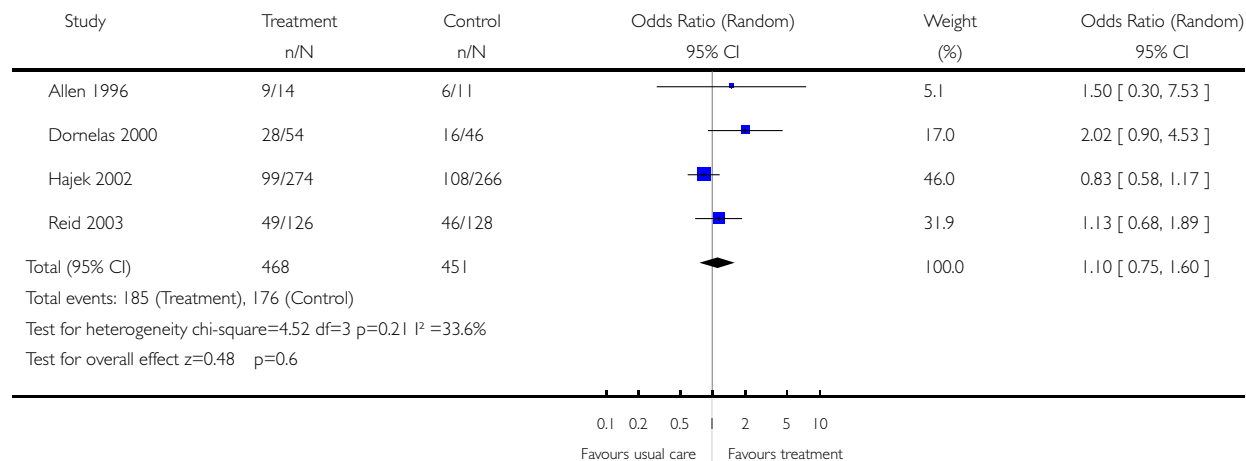


Analysis 01.02. Comparison 01 Efficacy of psychosocial interventions on abstinence (6 to 12 months; all trials), Outcome 02 Abstinence 6 to 12 months (ITT preferred and OM)

Review: Psychosocial interventions for smoking cessation in patients with coronary heart disease

Comparison: 01 Efficacy of psychosocial interventions on abstinence (6 to 12 months; all trials)

Outcome: 02 Abstinence 6 to 12 months (ITT preferred and OM)

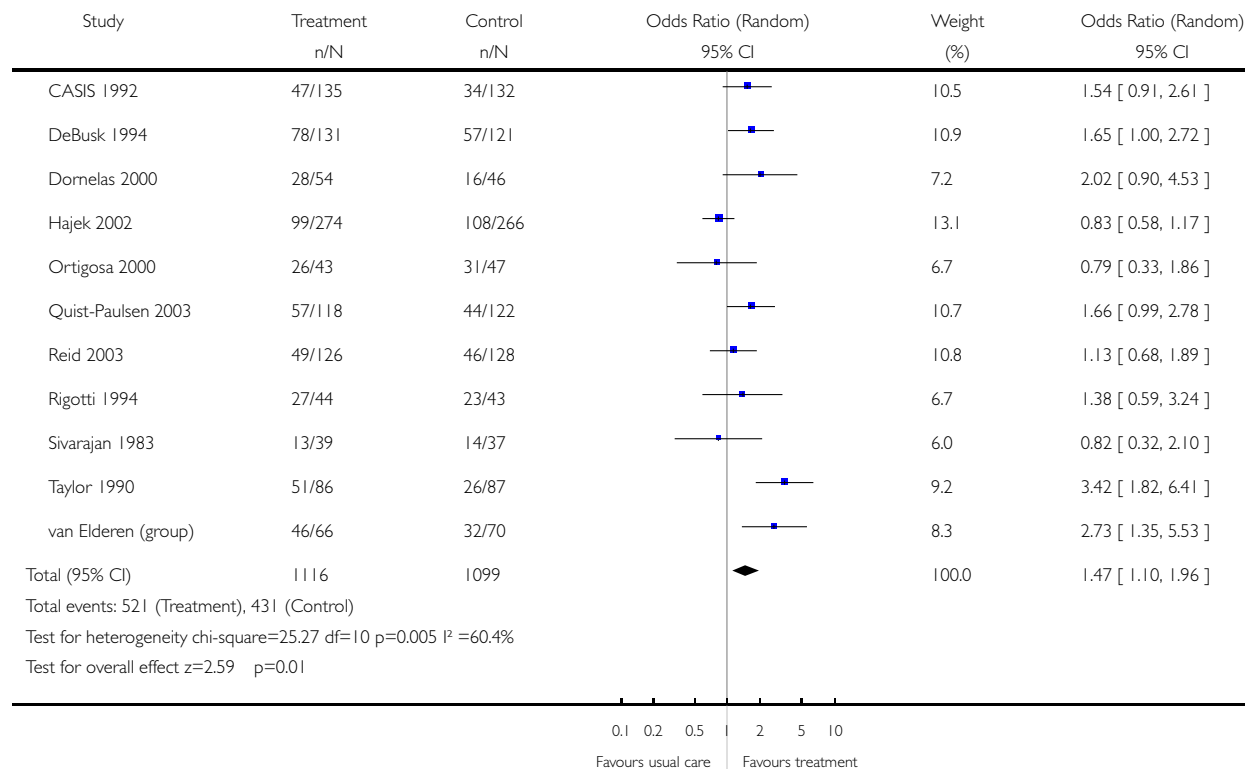


Analysis 01.03. Comparison 01 Efficacy of psychosocial interventions on abstinence (6 to 12 months; all trials), Outcome 03 Abstinence 6 to 12 months (ITT only)

Review: Psychosocial interventions for smoking cessation in patients with coronary heart disease

Comparison: 01 Efficacy of psychosocial interventions on abstinence (6 to 12 months; all trials)

Outcome: 03 Abstinence 6 to 12 months (ITT only)

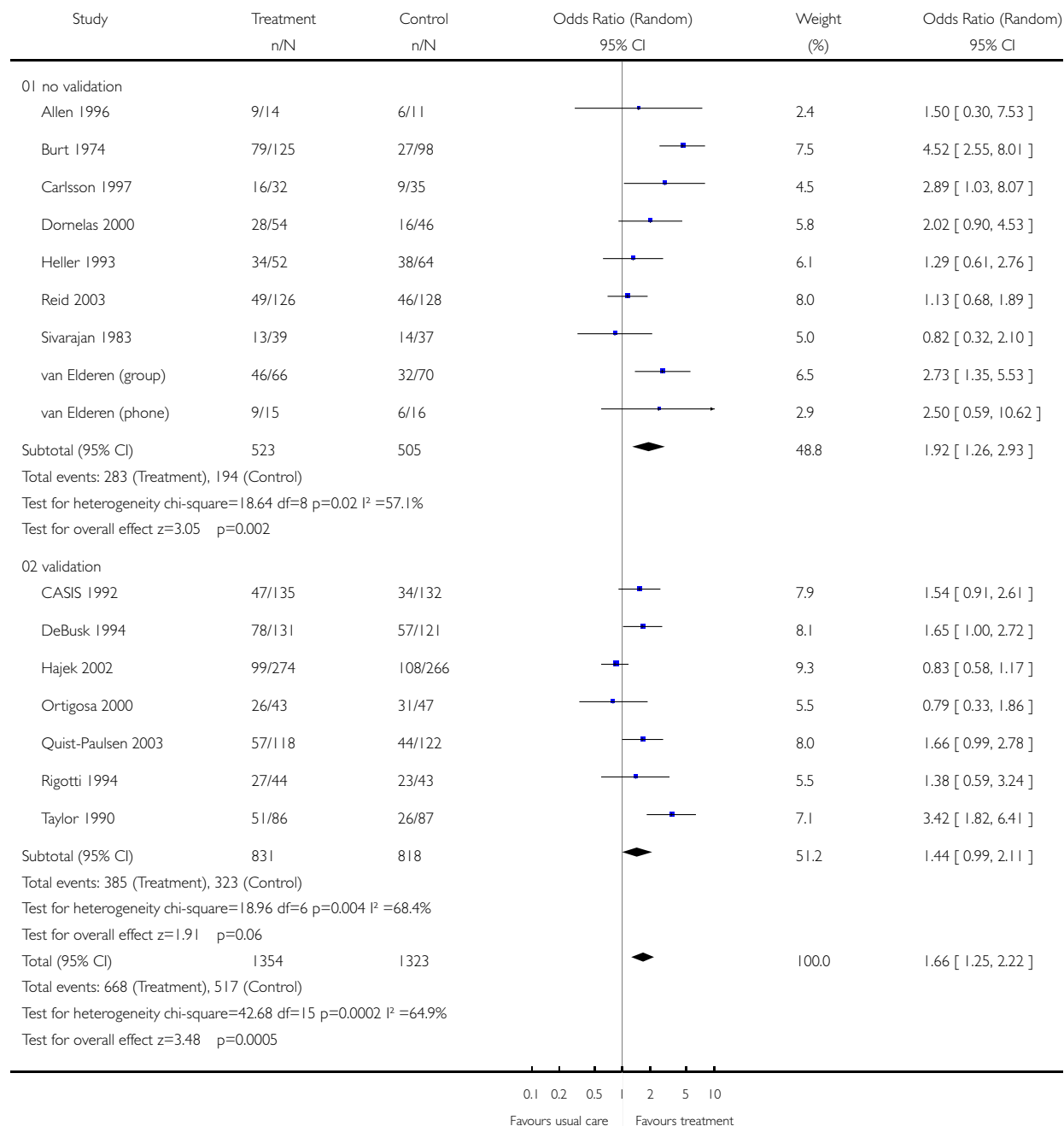


Analysis 02.01. Comparison 02 Sensitivity analysis validation (abstinence 6 to 12 months), Outcome 01 Abstinence at 6 to 12 months

Review: Psychosocial interventions for smoking cessation in patients with coronary heart disease

Comparison: 02 Sensitivity analysis validation (abstinence 6 to 12 months)

Outcome: 01 Abstinence at 6 to 12 months

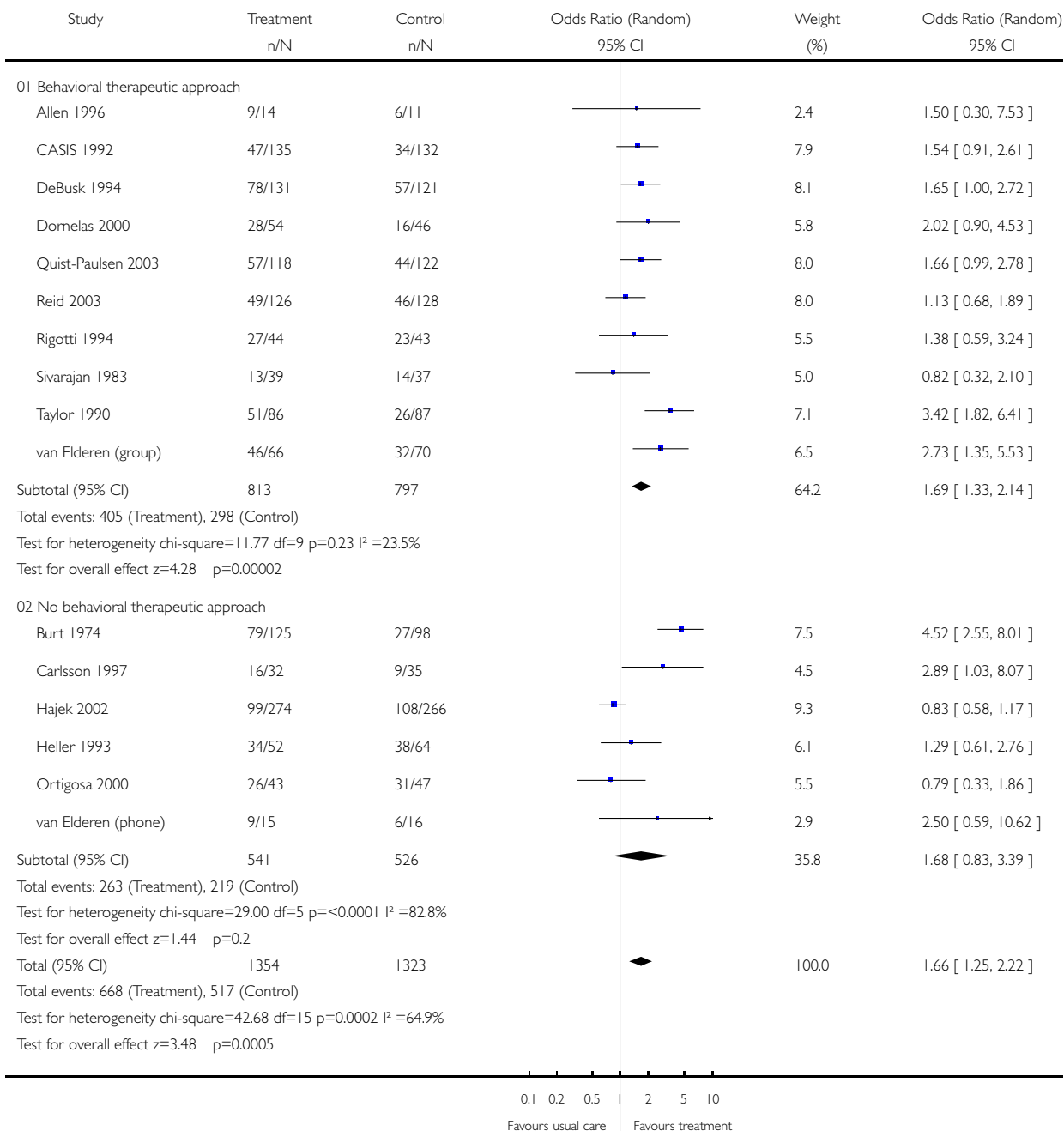


Analysis 03.01. Comparison 03 Grouped by type of intervention (6 to 12 months), Outcome 01 Abstinence 6 to 12 months BEHAVIORAL THERAPY

Review: Psychosocial interventions for smoking cessation in patients with coronary heart disease

Comparison: 03 Grouped by type of intervention (6 to 12 months)

Outcome: 01 Abstinence 6 to 12 months BEHAVIORAL THERAPY

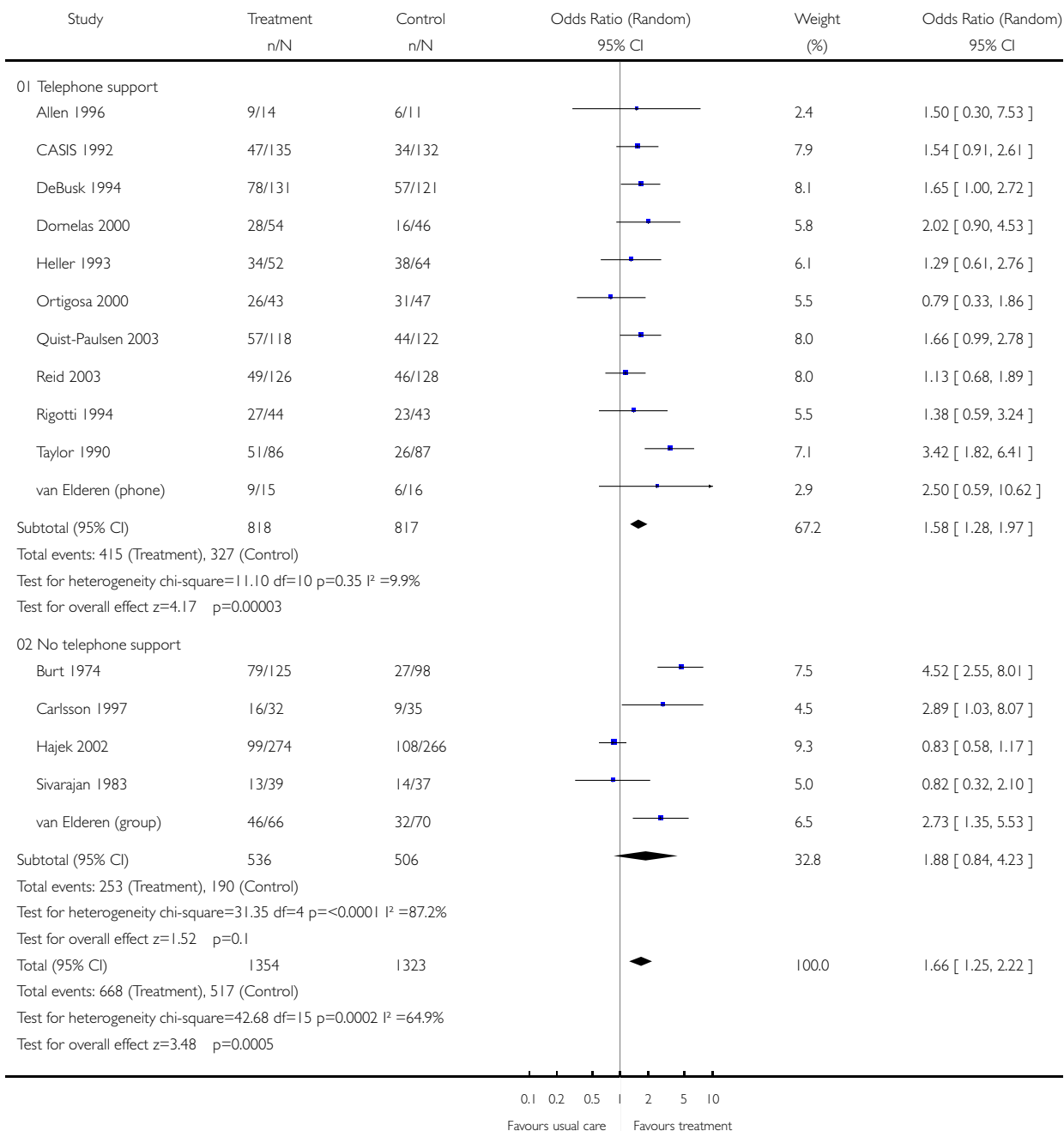


Analysis 03.02. Comparison 03 Grouped by type of intervention (6 to 12 months), Outcome 02 Abstinence 6 to 12 months TELEPHONE SUPPORT

Review: Psychosocial interventions for smoking cessation in patients with coronary heart disease

Comparison: 03 Grouped by type of intervention (6 to 12 months)

Outcome: 02 Abstinence 6 to 12 months TELEPHONE SUPPORT

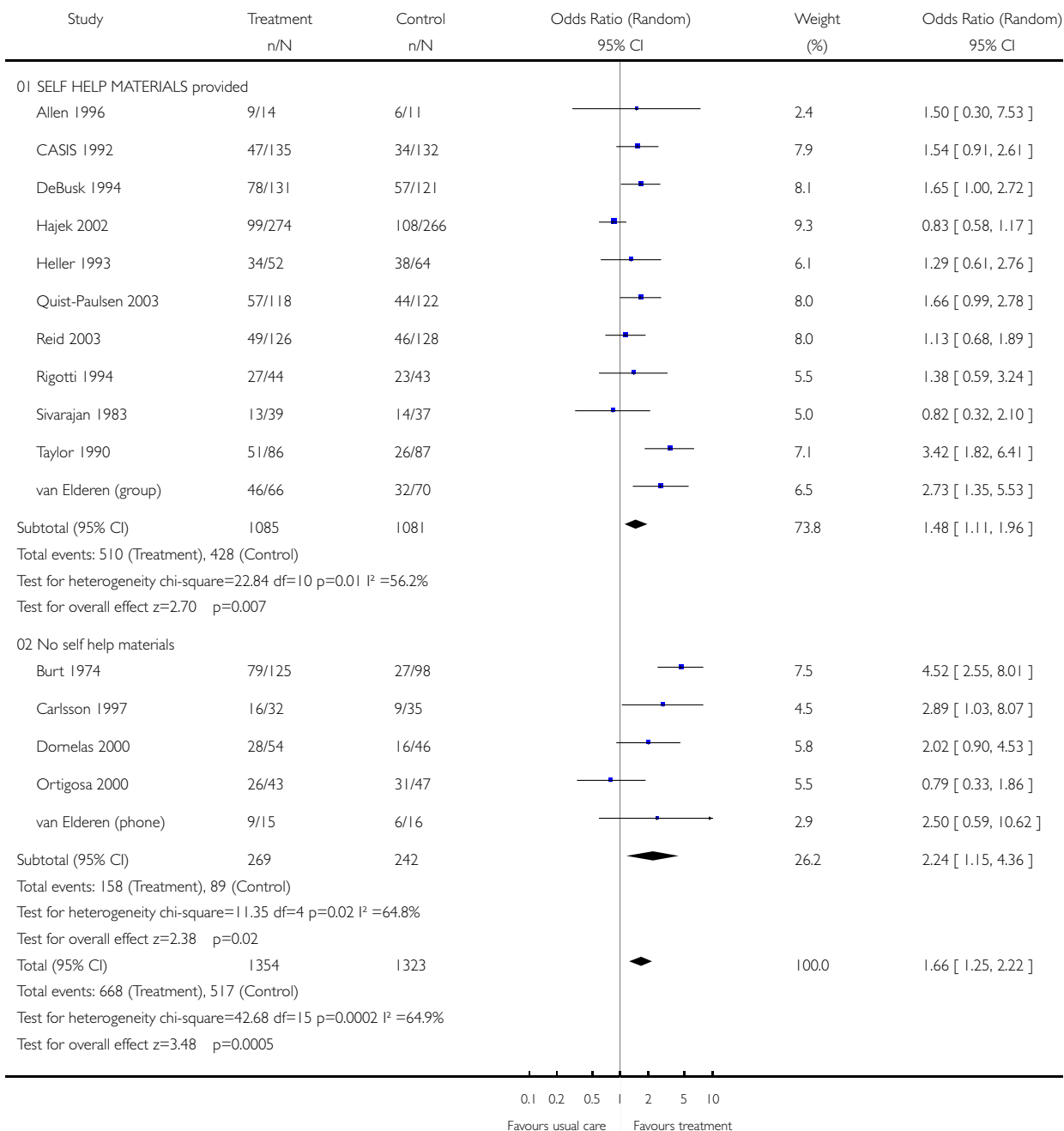


Analysis 03.03. Comparison 03 Grouped by type of intervention (6 to 12 months), Outcome 03 Abstinence 6 to 12 months SELF HELP MATERIALS

Review: Psychosocial interventions for smoking cessation in patients with coronary heart disease

Comparison: 03 Grouped by type of intervention (6 to 12 months)

Outcome: 03 Abstinence 6 to 12 months SELF HELP MATERIALS

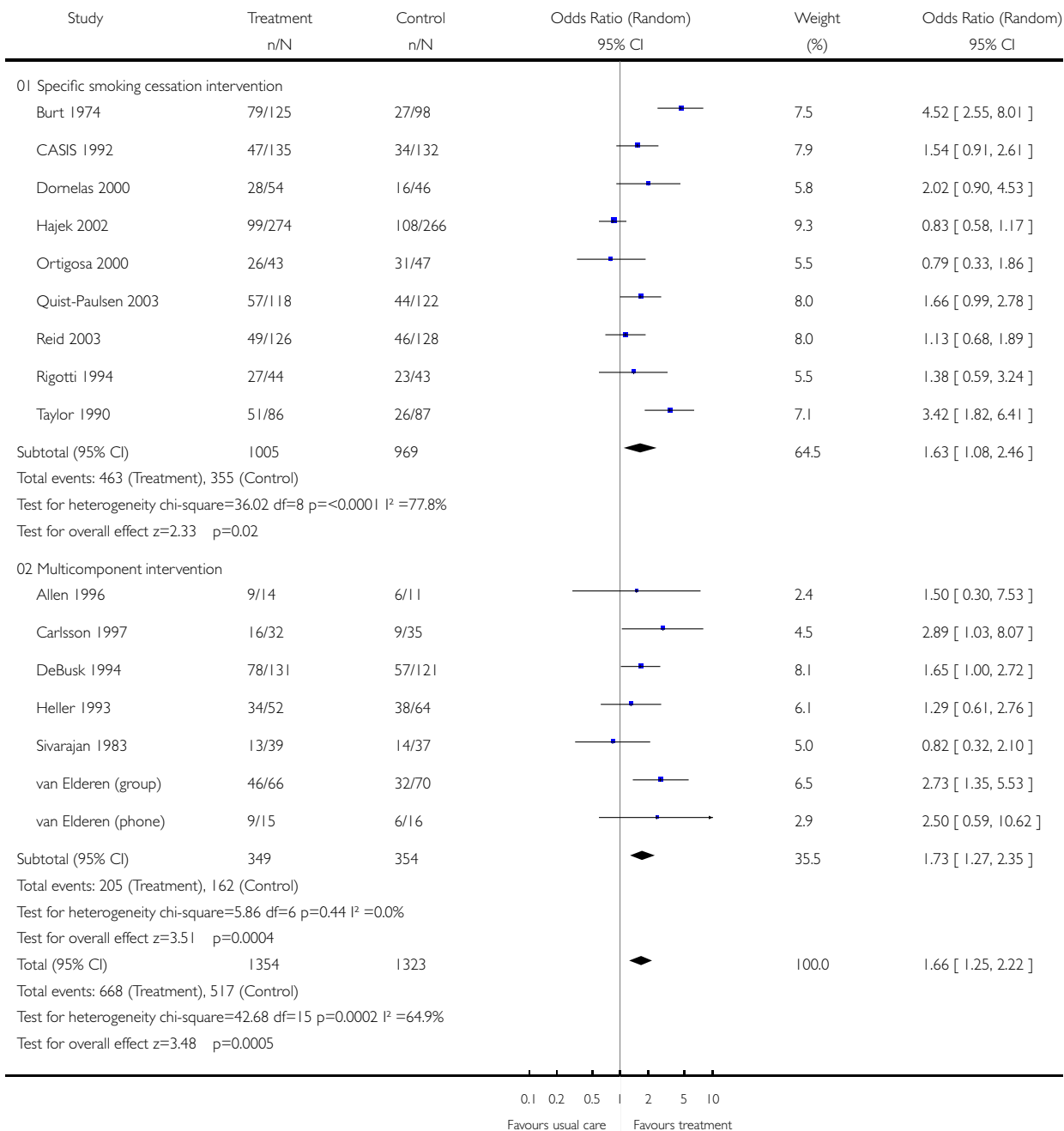


Analysis 03.04. Comparison 03 Grouped by type of intervention (6 to 12 months), Outcome 04 Abstinence 6 to 12 months Specific vs. Multi-Risk-Factor Intervention

Review: Psychosocial interventions for smoking cessation in patients with coronary heart disease

Comparison: 03 Grouped by type of intervention (6 to 12 months)

Outcome: 04 Abstinence 6 to 12 months Specific vs. Multi-Risk-Factor Intervention

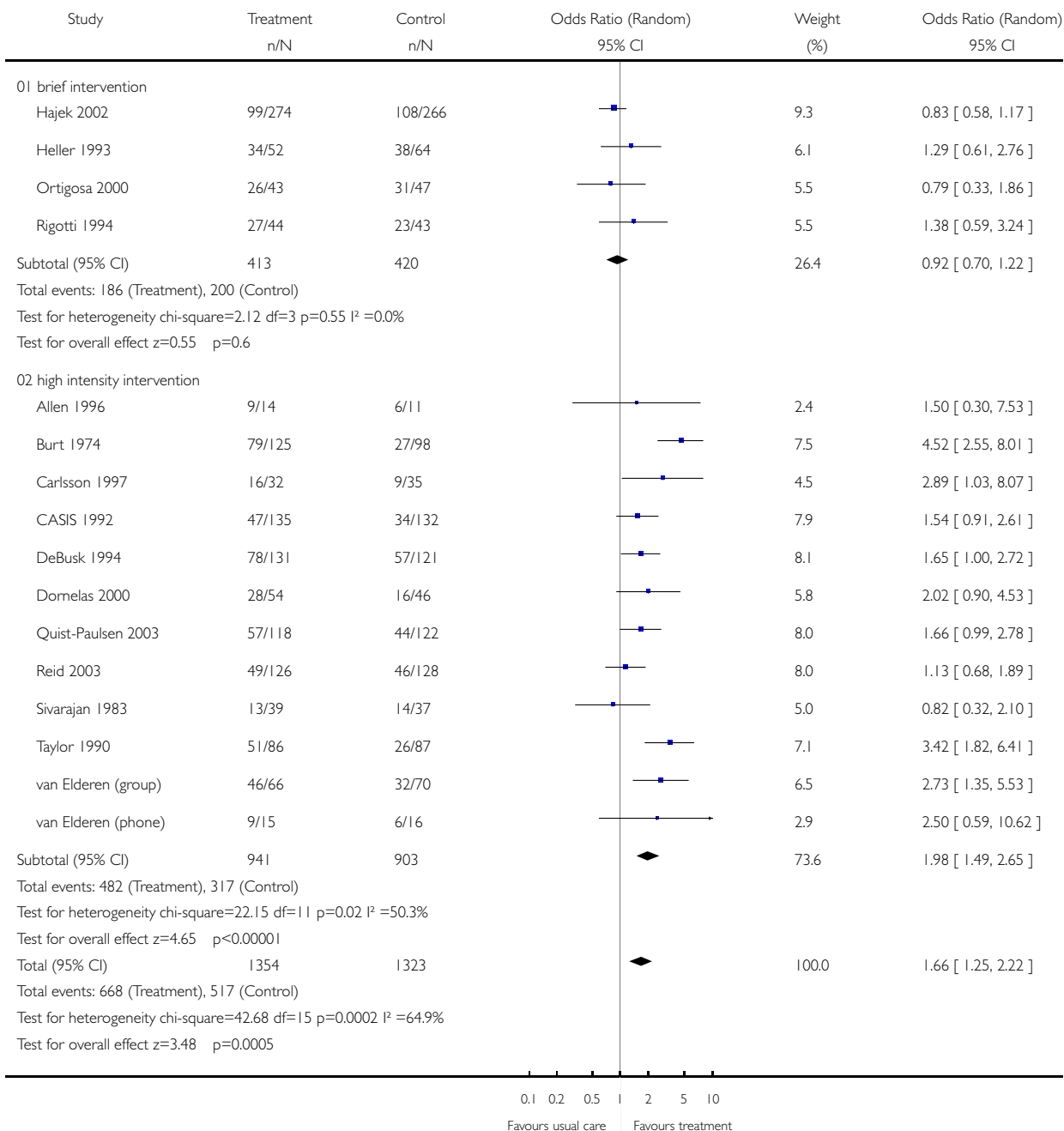


Analysis 04.01. Comparison 04 Sensitivity analysis brief / intense intervention (6 to 12 months), Outcome 01 Abstinence 6 to 12 months all studies

Review: Psychosocial interventions for smoking cessation in patients with coronary heart disease

Comparison: 04 Sensitivity analysis brief / intense intervention (6 to 12 months)

Outcome: 01 Abstinence 6 to 12 months all studies

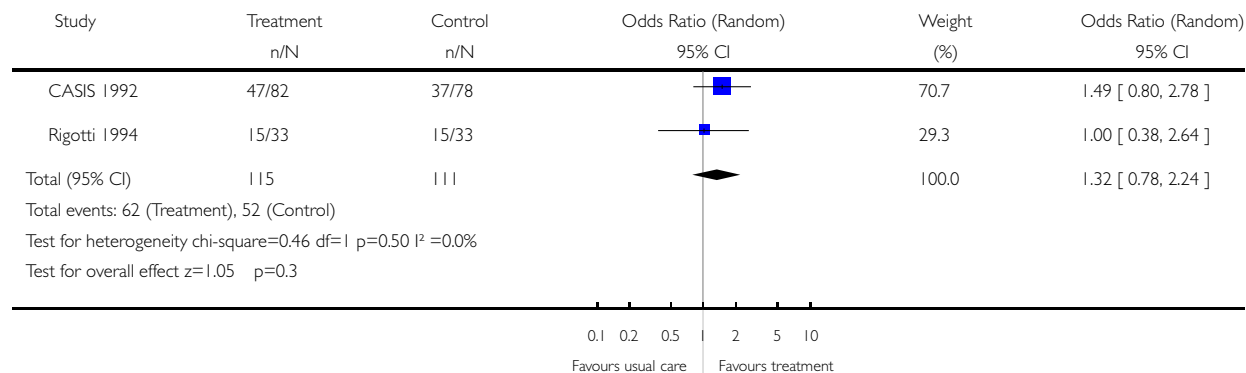


Analysis 05.01. Comparison 05 Efficacy of psychosocial interventions on long term abstinence (five years), Outcome 01 Abstinence five years (OM only)

Review: Psychosocial interventions for smoking cessation in patients with coronary heart disease

Comparison: 05 Efficacy of psychosocial interventions on long term abstinence (five years)

Outcome: 01 Abstinence five years (OM only)



Analysis 05.02. Comparison 05 Efficacy of psychosocial interventions on long term abstinence (five years), Outcome 02 Abstinence five years (ITT only)

Review: Psychosocial interventions for smoking cessation in patients with coronary heart disease

Comparison: 05 Efficacy of psychosocial interventions on long term abstinence (five years)

Outcome: 02 Abstinence five years (ITT only)

